

GENERIC · POWERTRAIN

P013F

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P013F

O2 Sensor Delayed Response - Lean to Rich Bank 1 Sensor 2

P013F means the downstream oxygen sensor on bank 1 is responding too slowly when the engine transitions from a lean condition to a rich condition, so the powertrain control module (PCM) sees a delayed voltage swing. The PCM monitors how quickly the sensor voltage rises after a commanded rich excursion, and it sets this code when that rise takes longer than the calibrated threshold.

SYSTEM

Powertrain

CODE TYPE

Generic (all makes)

SEVERITY

Medium

FIX DIFFICULTY

Intermediate

AREA

Fuel and air metering

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- A slight hesitation or stumble during acceleration when the engine transitions from lean to rich
- Reduced fuel economy as the PCM compensates for the lazy sensor signal
- Occasional rough idle or unstable idle quality
- Failed emissions inspection due to the stored code and incomplete monitor
- In rare cases, a faint sulfur or rotten egg smell from the exhaust if the catalyst is being overworked

Common causes, most likely first

- 1 Aged or contaminated downstream oxygen sensor that responds sluggishly to mixture changes
- 2 Exhaust leaks upstream of the sensor, allowing outside air to dilute the sample and slow the response
- 3 Wiring damage or corroded connector pins at the sensor or PCM, adding resistance to the signal circuit
- 4 A failing catalytic converter that is not switching the exhaust chemistry as expected, confusing the sensor response test
- 5 An exhaust leak between the catalyst and the sensor that lets fresh air reach the sensor tip
- 6 Use of leaded fuel, silicone-based sealants, or excessive oil consumption contaminating the sensor element
- 7 A PCM calibration issue or a sensor that is the wrong part number for the application, though this is less common



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data to confirm the code and check for related oxygen sensor or fuel trim codes
- 2 Visually inspect the downstream oxygen sensor, its wiring, and the connector for damage, corrosion, or contamination
- 3 Check for exhaust leaks between the manifold and the sensor using a smoke machine or by listening for ticking when cold
- 4 Graph the downstream oxygen sensor voltage on a scan tool during a snap-throttle test to confirm the slow lean-to-rich response
- 5 Test the sensor heater circuit and signal circuit resistance to rule out wiring faults before condemning the sensor
- 6 Replace the downstream oxygen sensor with the correct part, then clear codes and verify the monitor completes
- 7 If the code returns after sensor replacement, recheck for exhaust leaks and evaluate the catalytic converter's efficiency

What a slow downstream sensor really tells you

- A downstream oxygen sensor that responds slowly is often a symptom of a failing catalytic converter rather than a bad sensor, so replacing the sensor first can waste money if the catalyst is degraded.
- Exhaust leaks between the catalyst and the sensor are a common missed cause because they let fresh air pulse past the sensor tip and delay the lean-to-rich voltage rise.
- The PCM may set P013F only after a specific drive cycle that includes a commanded rich excursion, so the code can appear intermittently and clear on its own after several good trips.
- Contamination from silicone sealants or coolant leaks can coat the sensor element and slow its response without setting a heater circuit code, so a visual inspection of the sensor tip is worthwhile.
- Some vehicles use a wide-range downstream sensor, and a scan tool that displays only a narrow 0-1 volt signal can mislead you into thinking the sensor is lazy when it is actually responding normally in its native format.

Can I keep driving with P013F?

You can usually continue driving with P013F, but avoid heavy acceleration and long trips until it is diagnosed because a lazy downstream sensor can mask a failing catalytic converter and increase emissions. If the check engine light starts flashing or you notice a significant loss of power, stop driving and have the vehicle inspected promptly.



Tools that help

- OBD-II scan tool with graphing capability
- Digital multimeter
- Smoke machine for exhaust leak detection
- Oxygen sensor socket
- Jack and jack stands or ramps

Reading P013F

P	Powertrain: engine, transmission and emissions.
0	Generic (SAE) code: it means the same thing on every OBD-II vehicle.
1	Fuel and air metering.
3F	The exact fault within that area.

Often seen with

P0130 O2 Sensor Circuit Malfunction (Bank 1 Sensor 1) · **P0136** O2 Sensor Circuit Malfunction (Bank 1 Sensor 2) · **P0137** O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2) · **P0138** O2 Sensor Circuit High Voltage (Bank 1 Sensor 2) · **P0420** Catalyst System Efficiency Below Threshold (Bank 1)

See it working

Watch the animated explainer [Inline-Four Engine X-Ray: Firing Order 1-3-4-2](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p013f/>

